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THE  
ONTARIO WATER RESOURCES  
COMMISSION  
WATER POLLUTION SURVEY  
of the  
MANSFIELD AREA  
TOWNSHIP OF McNAB

MANSFIELD AREA - 1966  
TOWNSHIP OF McNAB

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380  
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1966  
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1966

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Report on a water pollution  
survey of the Mansfield area in  
the Township of McNab.

80307

THE  
ONTARIO WATER RESOURCES  
COMMISSION

Report on a  
WATER POLLUTION SURVEY

of the  
MANSFIELD AREA

in the  
TOWNSHIP OF McNAB  
COUNTY OF RENFREW

Division of Sanitary Engineering

1 9 6 6

WATER POLLUTION SURVEY

of the

MANSFIELD AREA

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MAP OF THE MANSFIELD AREA

## WATER POLLUTION SURVEY

of the

### MANSFIELD AREA

#### INTRODUCTION

A water pollution survey was performed in the Mansfield area in the Township of McNab during the period March 15 to 18, 1966. Surveys of this nature are performed by the Ontario Water Resources Commission routinely and upon request for the purpose of locating and recording sources of existing and potential water pollution. Where these sources are noted, recommendations concerning their abatement are made to the parties concerned.

A similar sanitary survey was conducted by staff of the Renfrew County Health Unit at the Sandy Beach and Sandy Hook areas, which border the Mansfield area, during July and August, 1965. The assistance provided by the Health Unit staff during this survey is gratefully acknowledged. Other officials contacted during this survey included.

Mr. S. Anderson, Clerk-Treasurer, Township of McNab;  
Mr. N. C. McKay, Township Foreman, Township of McNab;  
Mr. W. F. Frieday, Town Engineer, Town of Arnprior.

#### MANSFIELD AREA

##### General

The Mansfield area is located immediately west of the Town of Arnprior. This is essentially a residential area

having a population of approximately 450 persons in some 150 homes.

There are no significant industries within the area and employment is chiefly provided in the Town of Arnprior.

A map of the Mansfield, Sandy Beach, and Sandy Hook areas is appended to this report.

#### Water Supply

Ground water is the source of water supply for the Mansfield area. During this survey a total of 80 premises were visited. Of these, 73 premises had well supplies of which 46 were dug wells and 27 were drilled wells. Seven of the properties visited had no or non-usable well supplies.

A total of 73 samples were collected from well supplies for bacteriological examinations. Of the samples collected, 40 (55 per cent) contained coliform organisms. Eight of the 40 adverse samples collected showed the presence of Escherichia Coliform or E. coli. organisms. These indicate contamination by wastes of human origin and therefore should not be tolerated in a potable water supply. When coliform organisms are present in a supply, the water should be disinfected before consumption.

Fifteen samples were collected for chemical analyses in a cross-section of the area. Water quality tended to range from hard to very hard with isolated instances of high iron concentrations. The presence of domestic wastes is indicated by

the anionic detergent as ABS concentration in several supplies. The results and significance of the analyses performed is appended to this report.

#### Sewage Disposal

The method of sewage disposal employed at the premises visited was determined as part of the survey. The data collected are tabulated as follows:

(a)	Number of septic tank systems	- 36
(b)	Number of outdoor privies	- 36
(c)	Other methods (including chemical toilets)	- 5
(d)	Undetermined methods of sewage disposal	- 3

Since the formation of the Renfrew County Health Unit in 1964, new sewage disposal systems installed in this area have received the benefit of inspection. Prior to this time, however, there was little control over the design, location and construction of subsurface disposal systems. Many septic tank systems and privies were located sufficiently close (within 50 feet) of well supplies to present a hazard to the water quality. Because of the heavy clay nature of the soil in some sections of the Mansfield area, the satisfactory operation of many subsurface disposal systems is not anticipated. It is also noted that 45 per cent of the premises visited utilized outdoor privies. Many of these privies were below public health standards.

#### Drainage

A tributary of Dochart Creek, known locally as Jade Creek, flows in a westerly direction through Mansfield. Due to



many low lying properties and the non-porous nature of the soil, drainage from the area is poor. The section of Mansfield immediately west of Division Street between Seymour and Moore Streets drains in open ditches to the Arnprior municipal storm sewer system. The results of samples collected from the ditch on the west side of Division Street indicate the presence of sanitary wastes. The remainder of the Mansfield area tends to drain westward to Jade and Dochart Creeks. Spring run-off conditions were in effect at the time of sampling of Jade Creek and only slight indications of contamination were revealed. It is anticipated that stream conditions would worsen during low flows in the summer period.

The results of the above samples are appended to this report.

#### SAMPLE RESULTS

All samples collected for bacteriological examination during this survey were submitted to the Ontario Department of Health Regional Laboratory in Ottawa, while the samples requiring chemical analyses were forwarded to the Ontario Water Resources Commission Laboratory at Toronto.

The Renfrew County Health Unit has informed the residents of the bacteriological quality of the well supplies on those properties where samples were collected. The results of chemical analyses performed on various well supplies are

appended to this report as are the results of samples collected from pertinent drainage courses. An interpretation of the analyses employed and the significance of the laboratory results are also included.

#### SANDY BEACH AND SANDY HOOK AREAS

A sanitary survey of Sandy Beach and Sandy Hook was conducted by the Renfrew County Health Unit during July and August, 1965. These areas are located immediately west of the Town of Arnprior between the Mansfield area and the Ottawa River.

This survey revealed that ground water is the predominant source of water supply and waste disposal is generally achieved by means of subsurface septic tank systems or privies. Samples were collected from individual well supplies for bacteriological examinations and the adequacy of sewage disposal facilities was determined, based on construction, method of disposal, and possibility of presenting a health nuisance.

A summary of the results of this above survey is provided as follows:

Total number of houses investigated	- 131
Number of water supplies	- 93
Number of water samples taken	- 128
Number of samples unsatisfactory	- 48 or 37.5%
Number of sewage systems unsatisfactory	- 40 or 30.8%

## CONSIDERATION OF WATER AND SEWAGE WORKS

The township officials are interested in developing water and sewage facilities for the Mansfield, Sandy Beach and Sandy Hook areas. Steps have been taken to determine the various schemes available for financing such projects.

The Town of Arnprior has indicated that it could provide services for these areas, which would eliminate the need for constructing water treatment and sewage treatment facilities.

## SUMMARY AND CONCLUSIONS

A water pollution survey was performed in the Mansfield area of the Township of McNab on March 15, 16, 17 and 18, 1966. This survey was performed with the assistance of the Renfrew County Health Unit which had previously conducted a sanitary survey of the Sandy Beach and Sandy Hook areas.

The results of samples collected from 73 wells in the Mansfield area revealed that 55 per cent of the sampled supplies were of doubtful or unsatisfactory quality. Investigations indicated that subsurface septic tank systems and privies are in general use as the methods of sewage disposal. The presence of coliform organisms in many well supplies is attributed to unsatisfactory private disposal sewage systems which had been improperly constructed, located and maintained. Poor drainage in the area may also contribute to contamination of well supplies.

The results of samples collected from drainage courses in the area also indicate that sanitary wastes are gaining access to road-side ditches.

As a result of this survey, it may be concluded that some ground-water contamination has occurred in the Mansfield area. This may be attributed to some degree to the unsatisfactory operation of some subsurface methods of waste disposal and to surface water drainage problems. The provision of a municipal water and sewage system would eliminate these unsatisfactory conditions.

#### RECOMMENDATIONS

1. The Township of McNab should continue its efforts to provide municipal water and sewage works for the Mansfield, Sandy Beach and Sandy Hook areas.

2. The Township should take steps to reduce flooding of low lying areas at Mansfield by constructing adequate drainage ditches.

Approved by: \_\_\_\_\_



L. G. South,  
Acting District Engineer,  
Division of Sanitary Engineering.

Prepared by: W. C. Stevens

mh

## APPENDIX

### INTERPRETATION OF ANALYSES

The analyses employed in this investigation to assess the quality of ground and surface water are as follows:

#### Bacteriological Examination

The Department of Health Laboratories utilize the Multiple Tube Fermentation procedure and determinations are made as a Most Probable Number (MPN) of bacteria per 100 millilitres. The presence of coliforms may indicate pollution from faecal and non-faecal sources, while *E. coli* organisms indicate pollution of intestinal origin only. Water is considered potable if no coliform organisms are present.

#### Chemical Analyses

##### Table I Analyses

#### Hardness

The hardness of water reflects the nature of the geological formations with which it has been in contact. Waters with a hardness of 250 or higher are considered hard. Hard water is safe for human consumption but results in excessive soap consumption.

#### Alkalinity

The alkalinity of natural waters is caused by three major classes of materials which may be ranked in order of their effect on pH as follows: - (i) hydroxides, (ii) carbonates and (iii) bicarbonates and other salts of weak acids. The alkalinity of water has little sanitary significance but is of importance in water treatment practices.

#### Iron

It is desirable that water used for domestic purpose contain less than 0.3 ppm of iron in order to avoid objectionable staining and sediment formation. At high iron levels, the iron can be detected as a metallic tangy taste in the water which some consumers find objectionable.

### Chloride

Chlorides in reasonable concentrations are not harmful to humans. At concentrations above 250 ppm they give a salty taste to the water which may be objectionable.

### pH

The pH value, for practical purposes, refers to acidity or alkalinity and is a measure of intensity rather than quantity. The pH scale extends from zero (very acidic) to 14 (very alkaline) with a middle value of 7, corresponding to neutrality at 25° Centigrade. The pH of surface water should be in the range of 6.7 to 8.5.

### Turbidity

This test is related more to consumer acceptance than to safety of the water. An upper limit of 5 units of turbidity is desirable.

### Anionic Detergents as ABS

The presence of anionic detergents as ABS is an indication that domestic wastes are present.

## Table II Analyses

### Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required for the stabilization of decomposable organic or chemical matter in the water. The completion of the laboratory test required five days, under the controlled incubation temperature of 20° Centigrade.

The Ontario Water Resources Commission objective for surface water quality is an upper limit of four (4) ppm.

### Solids

The value for total solids expressed in parts per million (ppm), is the sum of the values for the suspended and dissolved matter in water. The concentration of suspended solids is generally the most significant of the solids analyses with regard to surface water quality.

The effects of suspended solids in water are reflected in difficulties associated with water purification, deposition in streams and injury to the habitat of fish.

TABLE I

## MANSFIELD AREA

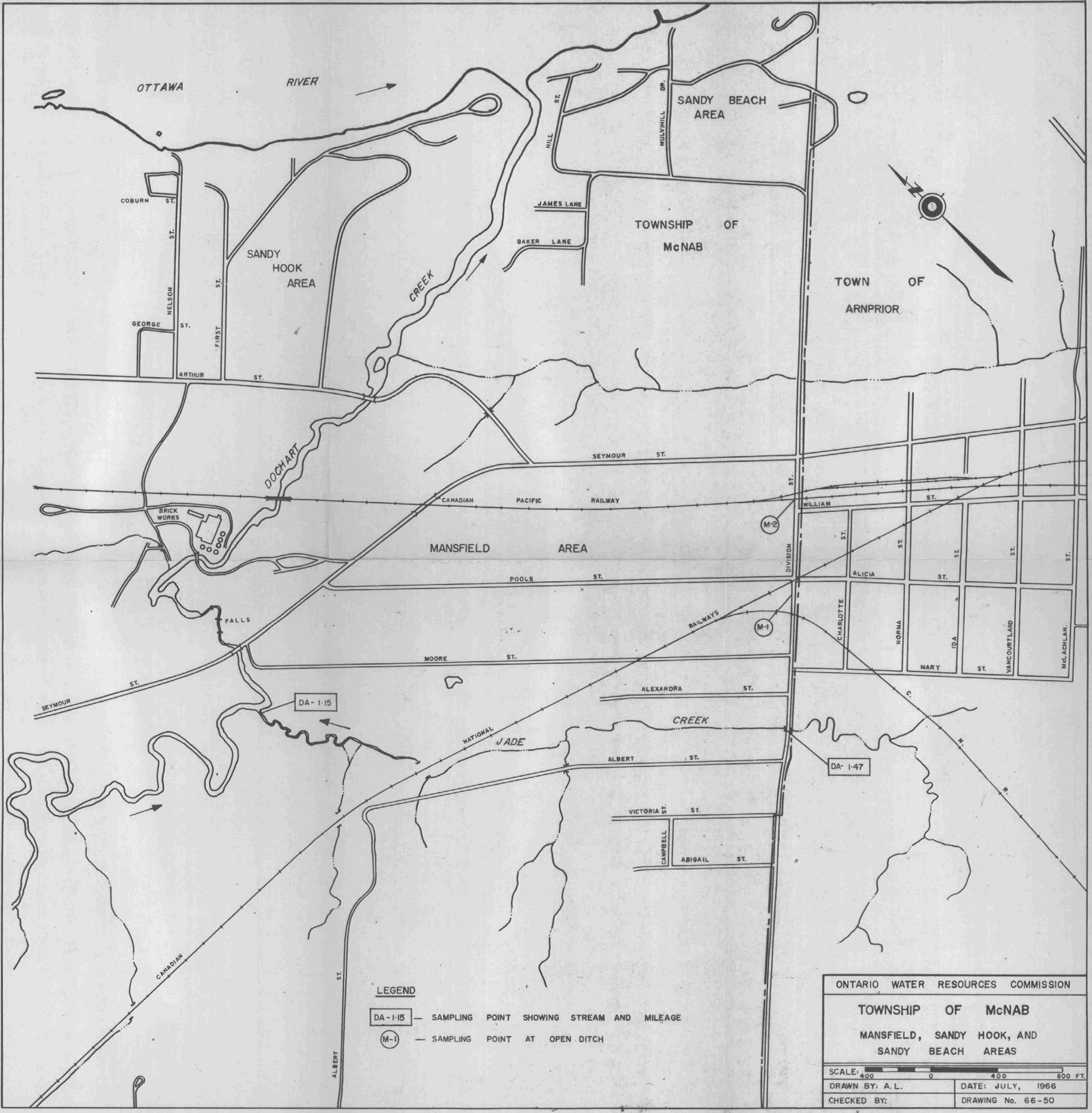
LAB. NO.	DESCRIPTION	DATE	HARDNESS AS $\text{CaCO}_3$	ALKALINITY AS $\text{CaCO}_3$	IRON AS FE	CHLORIDE AS CL	PH	TURBIDITY UNITS	5-DAY BOD	ANIONIC DETERGENTS	
							AT LAB.			AS	ABS
W-1593	JOHNSTON SADLER - SEYMOUR ST. (EAST END) - DUG WELL 22'	MARCH 16/66	210	138	0.88	36	7.5	12.5	2.0	0.1	
W-1594	GARY ARMSTRONG - SEYMOUR ST. (CENTRE) - DRILLED WELL	MARCH 16/66	300	227	0.06	34	7.7	0.6	0.6	0.0	
W-1595	B. FRAPPIER - SEYMOUR ST. (WEST END) - DRILLED WELL 80'	MARCH 16/66	340	253	0.07	45	7.5	1.4	0.4	0.1	
W-1596	RICHARD NEUMAN - POOLE ST. (EAST END) - DRILLED WELL 118'	MARCH 16/66	80	375	0.22	11	8.5	1.0	1.6	0.0	
W-1597	MISS N. SCHULTZ - POOLE ST. (CENTRE) - DUG WELL 38'	MARCH 16/66	510	432	0.15	93	7.8	0.8	1.2	0.0	
W-1598	J.A. ROBERTSON - POOLE ST. (WEST END) - DUG WELL 35'	MARCH 16/66	210	157	0.07	22	7.6	0.6	0.4	0.0	
W-1599	A. MILLER - ABIGAIL ST. (CENTRE) - DRILLED WELL 116'	MARCH 17/66	240	182	0.22	22	7.6	1.3	0.3	0.0	
W-1600	G. FERGUSON - VACANT LOT CORNER OF MOORE & DIVISION STS. - DRILLED WELL	MARCH 17/66	440	446	0.30	27	7.5	1.0	0.4	0.0	
W-1601	W. RECKENBERG - MOORE ST. (EAST END) - DUG WELL 30'	MARCH 17/66	320	250	1.27	48	7.4	6.0	0.5	0.0	
W-1602	G. RECKENBERG - MOORE ST. (CENTRE) - DUG WELL 29'	MARCH 17/66	370	390	0.96	13	7.5	2.1	0.6	0.0	
W-1603	E. MOSSEAU - ALEXANDRA ST. (EAST END) - DUG WELL 38'	MARCH 17/66	430	381	0.14	72	7.4	0.8	1.1	0.4	
W-1604	H. REBERTZ - ALEXANDRA ST. (WEST END) - DRILLED WELL	MARCH 17/66	420	342	0.08	62	7.3	0.7	0.4	0.0	
W-1605	R. PIERCE - ALBERT ST. (CENTRE) - DUG WELL	MARCH 17/66	290	229	0.07	51	7.3	0.7	0.6	0.0	
W-1606	M. J. FELHAVER - VICTORIA ST. (EAST END) -	MARCH 17/66	270	235	0.08	26	7.5	0.8	0.2	0.0	
W-1607	R. O'BRIEN - VICTORIA ST. (WEST END) - DUG WELL 30'	MARCH 17/66	240	175	0.24	26	7.1	2.3	0.6	0.0	



TABLE II

MANSFIELD AREA

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	5-DAY BOD	S O L I D S			ANIONIC DETERGENTS		MPN	
				TOTAL	SUSP.	DISS.	AS	ABS	TOTAL COLIFORM ORGANISMS	E. COLI
DA 1.15	JADE CREEK ABOVE JUNCTION WITH DOCHART CREEK	MARCH 16, 1966	1.2	270	12	258	--	--	--	15
DA - 1.47	JADE CREEK AT DIVISION STREET	MARCH 16, 1966	0.8	270	12	258	--	--	39+	0
M - 1	DITCH - WEST SIDE OF DIVISION ST. AT SOUTH SIDE OF C.N.R.	MARCH 18, 1966	6.8	800	766	166	0.5		39	39
M - 2	DITCH - WEST SIDE OF DIVISION ST. AT SOUTH SIDE OF C.P.R.	MARCH 18, 1966	3.6	356	196	160	1.3		39+	39+



LEGEND

- DA-1-15 — SAMPLING POINT SHOWING STREAM AND MILEAGE
- (M-1) — SAMPLING POINT AT OPEN DITCH

ONTARIO WATER RESOURCES COMMISSION

TOWNSHIP OF McNAB

MANSFIELD, SANDY HOOK, AND  
SANDY BEACH AREAS

SCALE: 400 0 400 800 FT.

DRAWN BY: A.L.

DATE: JULY, 1966

CHECKED BY:

DRAWING No. 66-50